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(56) Documents Cited:
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UK CL (Edition V) F2V
INT CL⁷ A61C, F16L
Other: Online databases: EPODOC, JAPIO, WPI

(54) Abstract Title: Tap connector for a water delivery device

(57) A connector 30 between inner threads 42 of a spout 41 of a tap 40 and a delivery tube 20 such as for a water-spray tooth cleaner (10, figure 7) has a main body having a fluid passage 32 into which a retaining member 21-24 attached to the tube 20 may be inserted. A securing plate 50 having an aperture is slidably received in a radial slot (33) through the connector body and is moveable against the bias of a resilient coil spring 60 when a knob 52 on the plate 50 is pressed from a first, retaining position in which a part of the plate 50 cooperates with a groove 22 in the retaining member to a second, release position in which a spring 35 may forcibly eject the retaining member from the body of the connector.

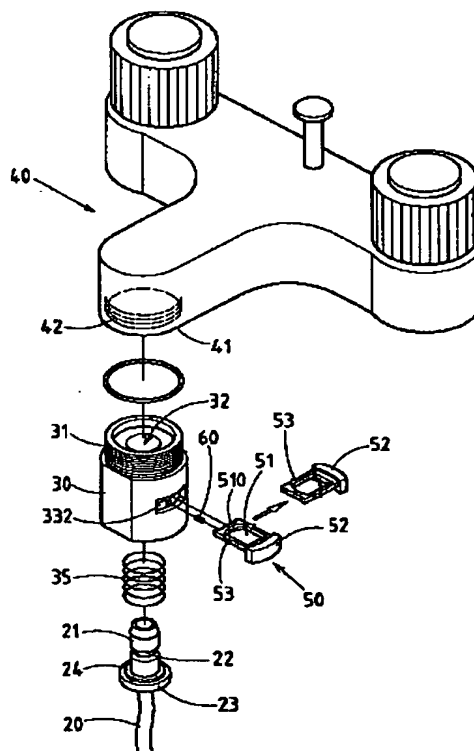


FIG.1

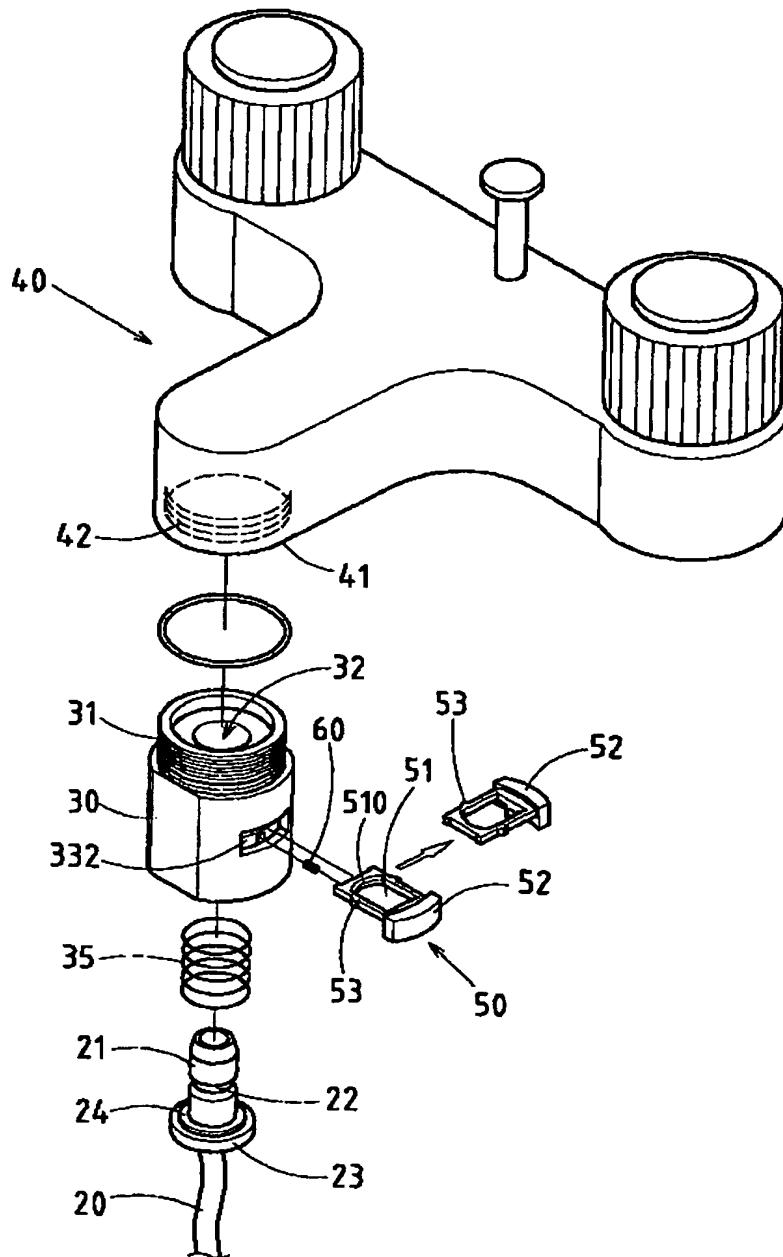


FIG.1

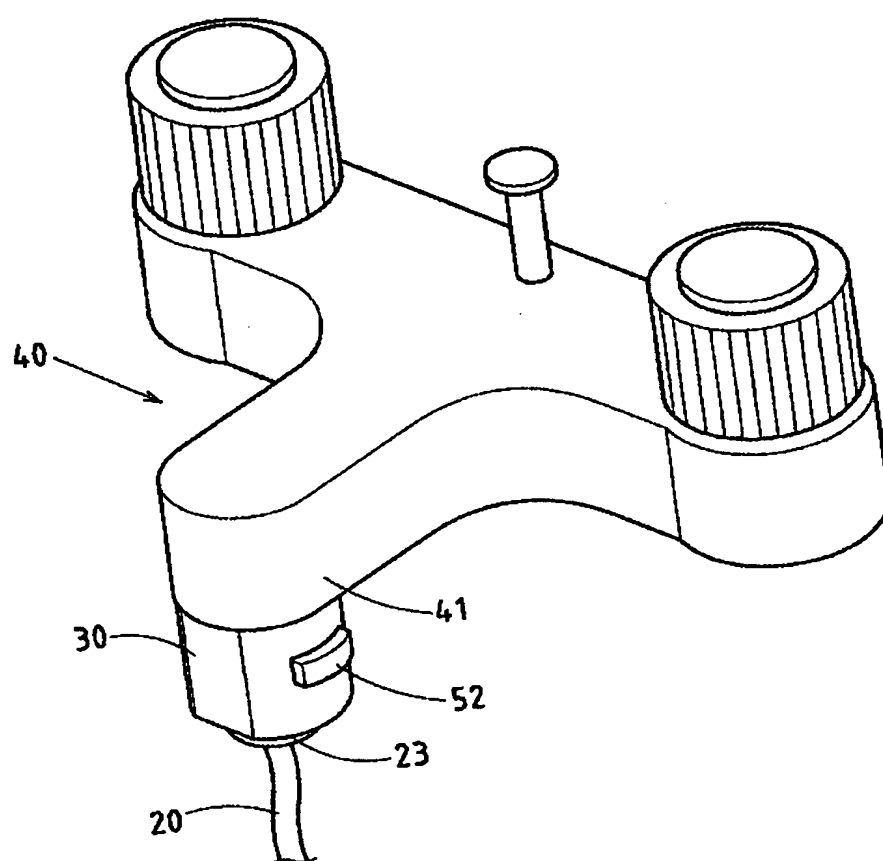


FIG. 2

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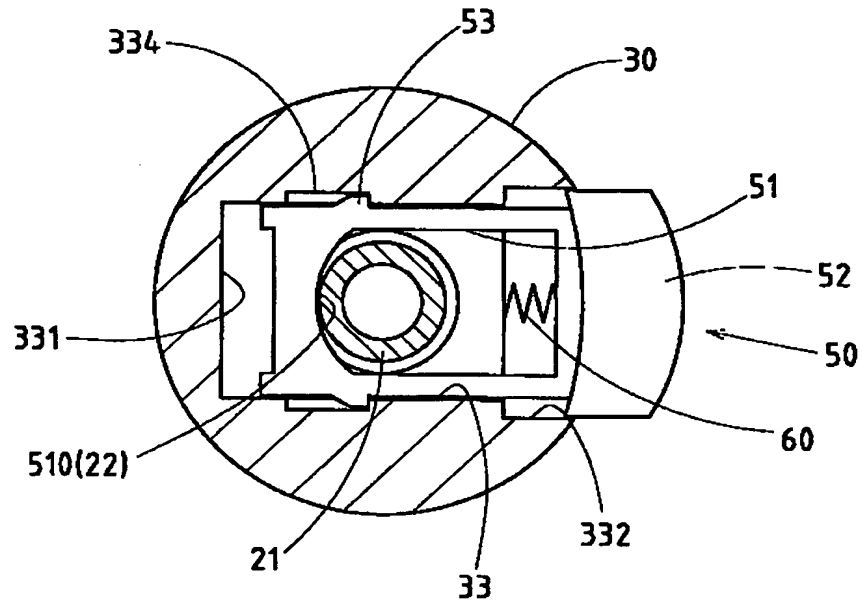


FIG.3

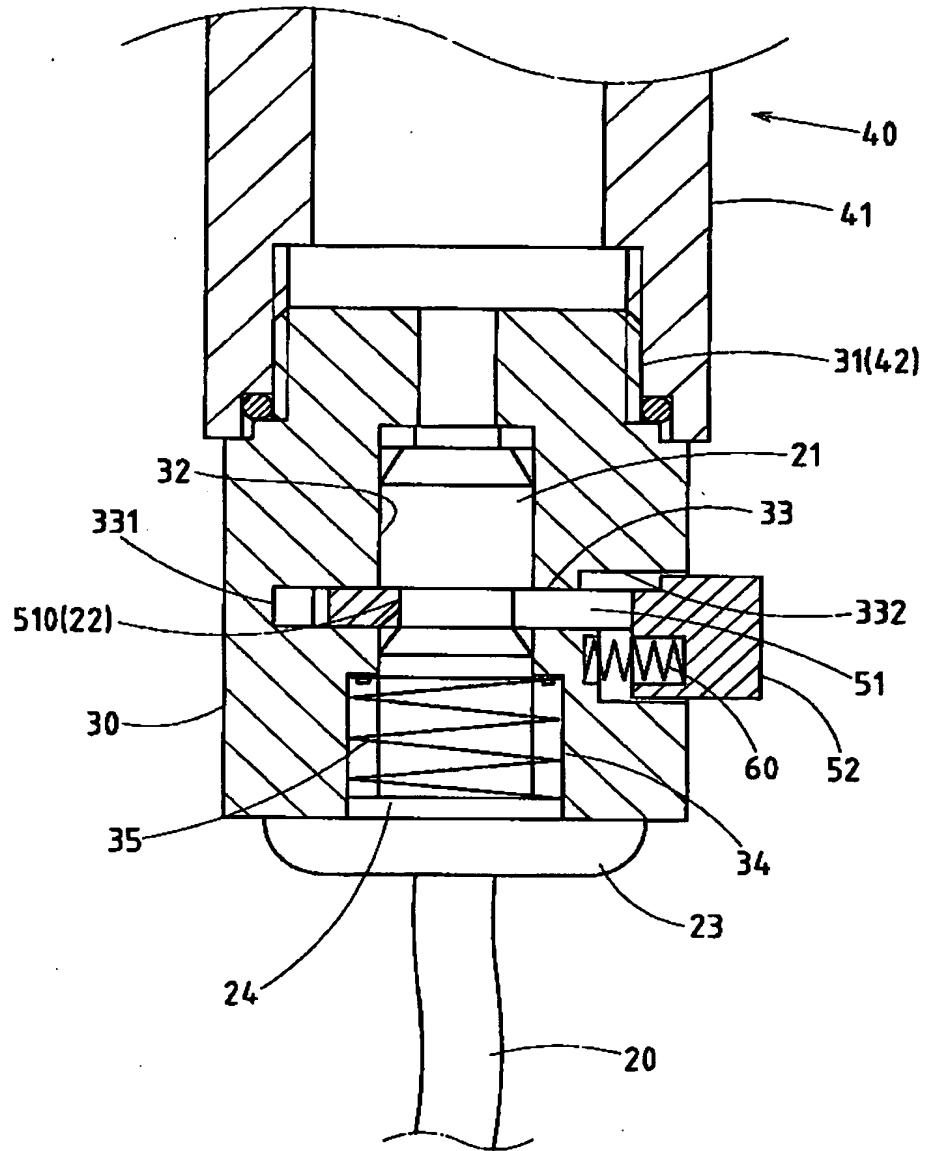


FIG.4

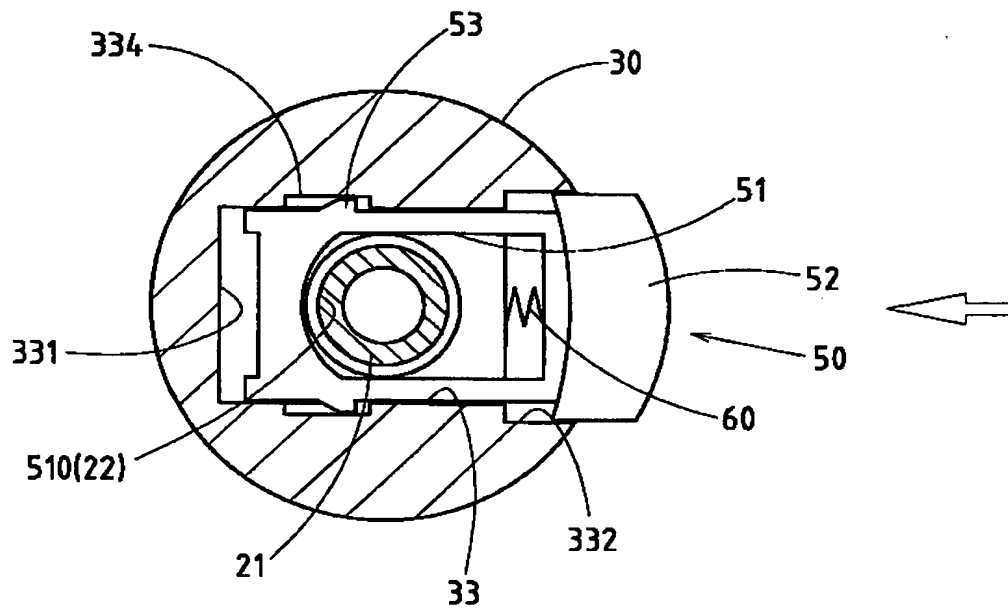


FIG.5

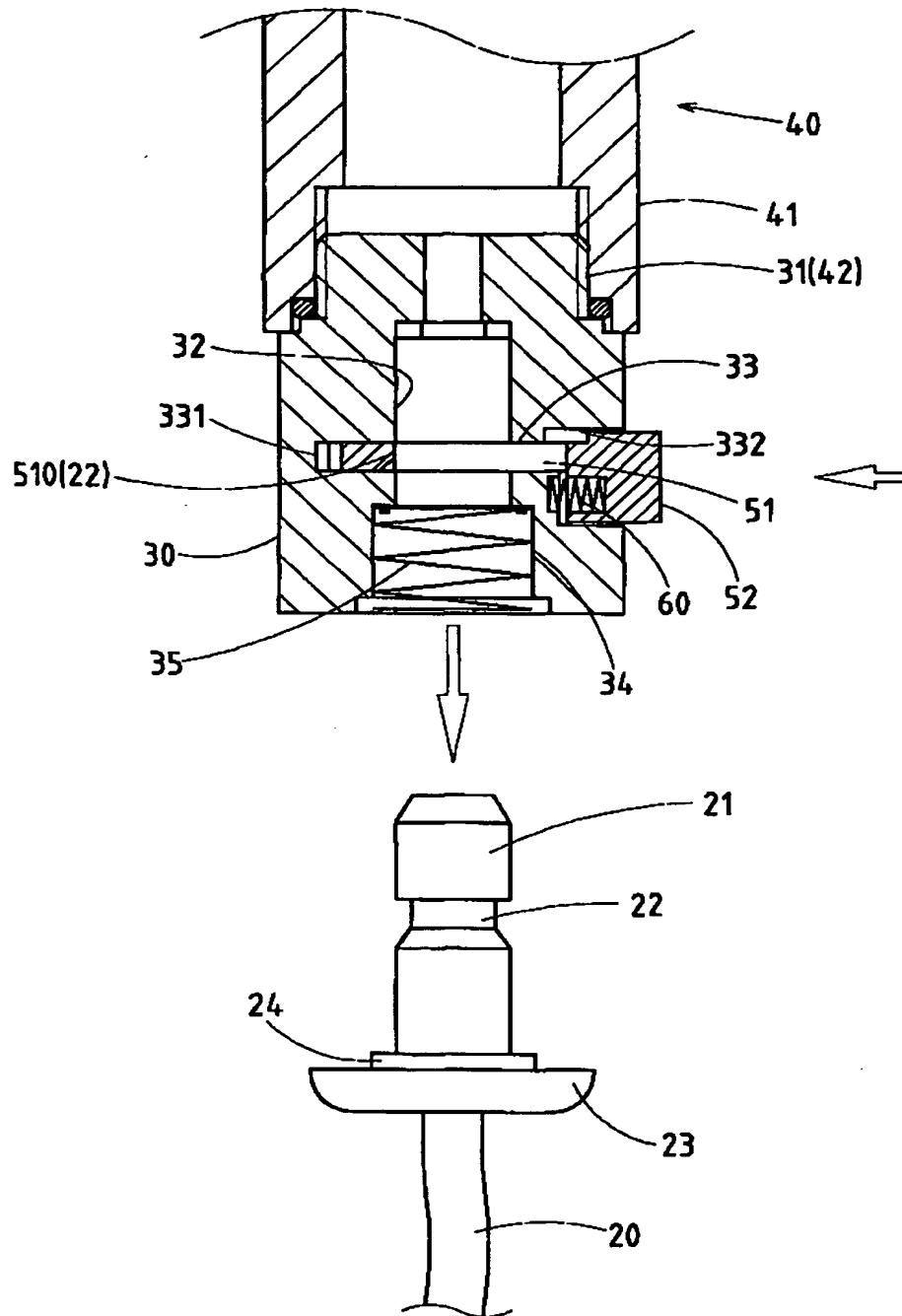
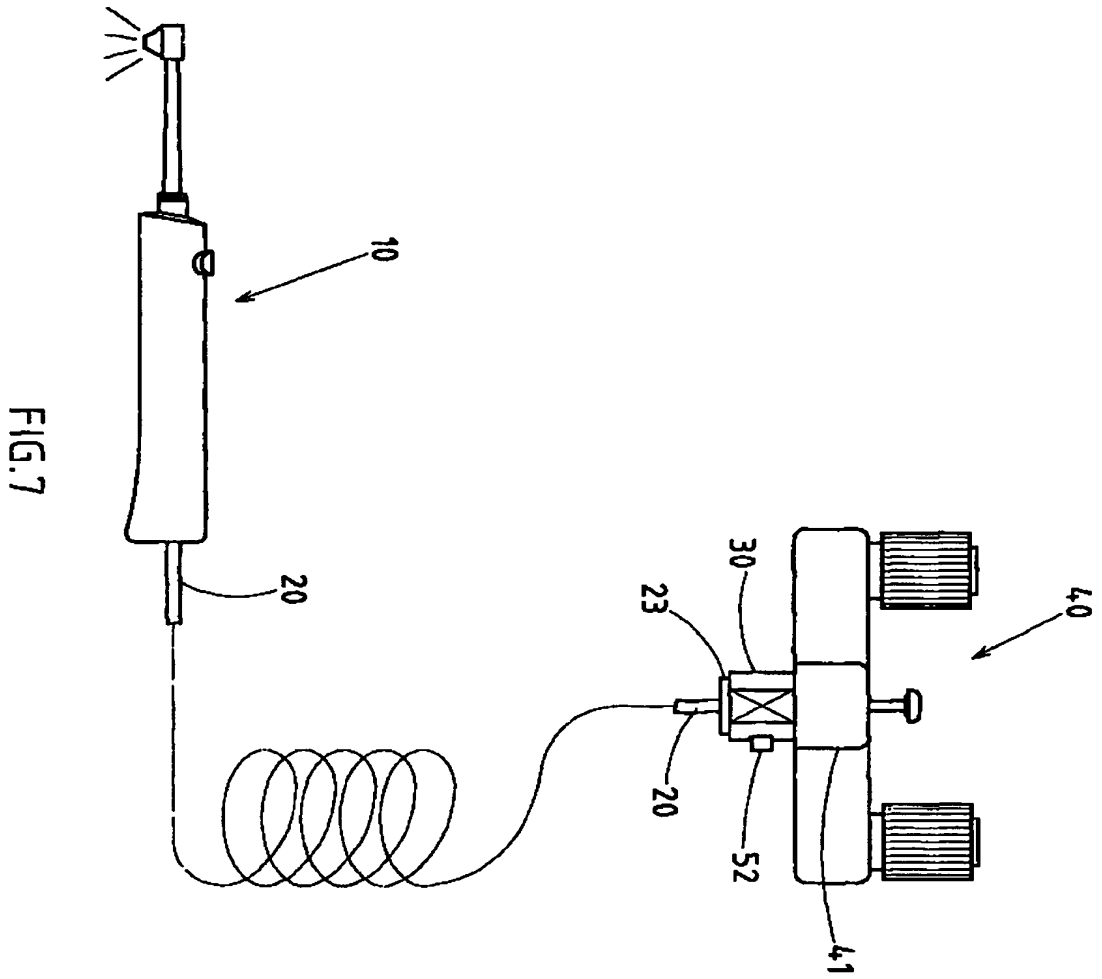


FIG.6



WATER DELIVERY DEVICE

The present invention relates to a water delivery device and more particularly to a device having a
5 connector for connecting the device to a water tap.

A typical water delivery device is a water-spray tooth cleaner. A conventional water-spray tooth cleaner is generally provided with a connector by which it can be connected to a water tap. The connector is provided
10 with a plurality of bolts for positioning the connector such that the inner ends of the bolts press against the outer wall of the water tap. The connector is rather primitive in design in that it can not be fastened and unfastened to the tap with ease and speed, and in that
15 the connector is susceptible to separation from the tap by the water pressure. The use of bolts to position the connector often results in water leakage. In addition, the task of tightening and loosening the bolts is time-consuming and irritating, thereby discouraging people to
20 use the water-spray tooth cleaner.

An objective of the present invention is to provide a water delivery device having a connector to facilitate the connecting of the device to a water tap.

Accordingly, in a first aspect, there is provided a
25 water delivery device including an delivery tube for delivering water from a tap, said tube having a retaining member; and a connector for connecting said

delivery tube to said tap, the connector comprising connection means for connecting said connector to said tap, a main body having an axial through-hole, a resilient member and a securing element, wherein said
5 retaining element is insertable into said axial through-hole and said securing element is moveable against the bias of the resilient member from a first position in which said securing element cooperates with said retaining member to secure the delivery tube to the
10 connector to a second position in which there is no cooperation between the securing element and retaining member.

This arrangement allows the connector to be releaseably or permanently connected to a water tap by
15 the connection means and allows the delivery tube to be easily and quickly connected and disconnected to the connector.

The connection means is a preferably a threaded portion which can cooperate with a complimentary
20 threaded portion on said tap.

The axial through-hole forms a water channel which is aligned with the spout of a water tap so that water can flow from the tap through the water channel formed by the axial through-hole unimpeded. In this way, the
25 connector can be left in place on the tap even when the water delivery device is not in use.

The delivery tube is connected at one end to the water delivery device and, at its other end, it is provided with a retaining member which preferably includes a grooved portion for cooperation with the
5 securing element when the securing element is in the first position.

The resilient member biases the securing element into the first position in which the retaining member is secured within the axial through-hole. The resilient
10 member is a preferably a coiled spring.

The securing element preferably comprises a plate which is slidable in a slot in the main body between the first and second positions in a direction perpendicular to the axis of the main body i.e. in a direction
15 perpendicular to the water channel through the main body. The plate has a central aperture defined at one end by an end wall. In the second position, the aperture is aligned with the axial through-hole and the retaining member can pass in and out of the axial
20 through-hole via the aperture. In the first position, the end wall partially occludes the axial through-hole so that the retaining member cannot pass in or out of the axial through-hole. If the retaining member is
25 is in the first position, the end wall extends into the grooved portion of the retaining member and the un-

grooved portion abuts the end wall but may not pass through the aperture.

In preferred embodiments, the securing element has at least one lug and the slot has at least one recess,
5 so that the at least one lug can be located in a respective recess to retain the securing element in the slot.

Preferably, the securing element further comprises a knob connected to said plate, said knob being located
10 to the exterior of the slot in the main body. The resilient means preferably extend between the knob and the main body such that depression of the knob moves the plate in the slot against the bias of the resilient member from the first position to the second position.

15 Preferably, the device further includes ejection means such that when the securing element is in the second position, the retaining member is ejected from the connector. The ejection means preferably comprises a coiled spring and an annular element located on the
20 retaining member such that insertion of the retaining member into the axial through-hole causes compression of said spring by said annular disc. When the retaining member is not secured in the axial-through hole, i.e. when the securing element is in the second position, the
25 return force of the spring pushes the retaining member from the connector.

The device is used firstly by connecting the connector to the tap using the connection means. The retaining member of the delivery tube is inserted into the axial through-hole and thereby cooperates with the securing member which will be biased into the first position. The water tap can be turned on and water will flow through the connector and delivery tube to the delivery device. To remove the delivery tube from the connector, the securing element is moved against the bias of the resilient member to the second position such that the retaining member and securing element no longer cooperate and the retaining member can be removed from the axial through hole (or can be ejected by the ejection means).

The features, functions, and advantages of the present invention will be more readily understood upon a deliberation of the following detailed description of a preferred embodiment of the present invention with reference to the accompanying drawings. The drawings show a water-spray tooth cleaner but the device could be any water delivery device.

Fig. 1 shows an exploded view of a preferred embodiment of the present invention;

Fig. 2 shows a perspective view of the preferred embodiment of the present invention in combination with a water tap;

Fig. 3 shows a cross-sectional view of the preferred embodiment of the present invention;

Fig. 4 shows a longitudinal sectional view of the preferred embodiment of the present invention;

5 Fig. 5 is a cross-sectional view to show the separation of the retaining member of the delivery tube from the securing element of the preferred embodiment of the present invention;

10 Fig. 6 shows a longitudinal sectional view of the preferred embodiment of the present invention as shown in Fig. 5.

Fig. 7 shows a schematic plan view of the preferred embodiment of the present invention in operation.

15 As shown in Figs. 1-7, a water-spray tooth cleaner 10 comprises an delivery tube 20 and a connector 30.

20 The connector 30 has connection means in the form of threaded portion 31 engageable with inner threads 42 of the spout 41 of a water tap 40, as shown in Fig. 1. The connector 30 is provided with an axial through-hole 32 forming a water canal. The connector 30 is further provided with a securing element 50, which is slidably received in a slot 33.

25 The securing element 50 is formed of a plate having an aperture 51 and a knob 52. The aperture is partially defined by an end wall 510 of the plate.

The securing element 50 is received in the slot 33 in such a manner that the aperture 51 is at least

partially aligned with the axial through hole 32, and the knob 52 protrudes to the exterior of the connector 30. The main body is provided with a recess 332 adjacent the slot. A resilient member 60 in the form of a coiled spring is located in the recess and abuts the back surface of the knob.

The slot 33 is provided with two recesses 334 which cooperate with two lugs 53 on the securing element. The securing element 50 is securely retained in the slot 33 by cooperation of the lugs 53 with the recesses 334, as shown in Fig. 3.

The delivery tube 20 is provided with a retaining member including an abutment disc 23, an annular element 24, and an engagement end 21. The retaining member is provided with a grooved portion 22.

As shown in Fig. 4, the connector 30 is provided with ejection means comprising an end recess 34 and a resilient member 35 in the form of a coiled spring which is located in the end recess 34 such that the spring 35 is compressed by the annular element 24 of the resilient member of the delivery tube 20 when the resilient member of the delivery tube 20 is inserted into the axial through-hole. When the resilient member is compressed, the abutment disc abut the bottom edge of the connector main body.

As shown in Fig. 6, the resilient member of the delivery tube 20 is ejected by the spring force of the

spring 35 when there is no cooperation between the securing element 50 and the retaining member.

The method of function will now be described. As shown in Figure 4, the connection means i.e. threaded portion 31 of the connector is used to connect the connector to the spout of a water tap. The retaining member is inserted into the axial through-hole of the connector when the securing element is in the second position and forms a tight fit. In the first position, the knob 52 of the securing element is pushed away from the main body by the resilient member 60 and in this position, the plate is positioned so that the end wall defining the aperture extends into the grooved portion and partially occludes the through-hole such that the retaining member cannot pass out of the through-hole via the aperture. As can be seen, the retaining member is prevented from leaving the connector by the abutment of the end wall against the un-grooved upper portion of the retaining member. In this first position, the annular element 24 compresses the spring 35 and the abutment disc abuts the base of the connector main body.

To release the retaining member, the knob 52 is pushed towards the main body thereby compressing the resilient member 60 and moving the securing element to the second position. In this second position, the end wall is moved away from the retaining member and no longer extends into in the grooved portion and occludes

the axial through-hole. The retaining member can therefore pass through the aperture and the spring 35 of the ejection means forces the retaining member from the connector as shown in Figure 6.

5 The embodiment of the present invention described above is to be regarded in all respects as being illustrative and nonrestrictive. Accordingly, the present invention may be embodied in other specific forms. The present invention is therefore to be limited
10 only by the scope of the following claims.

CLAIMS:

1. A water delivery device including
an delivery tube for delivering water from a tap,
5 said tube having a retaining member; and
a connector for connecting said delivery tube to
said tap, the connector comprising connection means for
connecting said connector to said tap, a main body
having an axial through-hole, a resilient member and a
10 securing element,
wherein said retaining element is insertable into
said axial through-hole and said securing element is
moveable against the bias of the resilient member from a
first position in which said securing element cooperates
15 with said retaining member to secure the tube to the
connector to a second position in which there is no
cooperation between the securing element and retaining
member.
2. A device according to claim 1 wherein said
20 connection means is a threaded portion for cooperation
with a complimentary threaded portion on said tap.
3. A device according to claim 1 or claim 2 wherein
said retaining member includes a grooved portion for
cooperation with said securing element when the securing
25 element is in the first position.
4. A device according to any one of claims 1 to 3
wherein said resilient member is a coiled spring.

5. A device according to any one of the preceding claims wherein said securing element comprises a plate which is slidable in a slot in the main body between said first and second positions in a direction
- 5 perpendicular to the axis of the main body, said plate having an aperture which is partially defined by an end wall, said end wall extending into said grooved portion when said securing element is in said first position.
6. A device according to claim 5 wherein, in said
- 10 first position, said end wall partially occludes said through-hole.
7. A device according to claim 5 or claim 6 wherein the securing element has at least one lug and the slot has at least one recess, the at least one lug being
- 15 located in a respective recess to retain the securing element in said slot.
8. A device according to any one of claims 5, 6 or 7 wherein said securing element further comprises a knob connected to said plate, said knob being located to the
- 20 exterior of said main body, said resilient means extending between said knob and said main body such that depression of said knob moves said plate in said slot against the bias of the resilient member from said first position to said second position.
- 25 9. A device according to any one of the preceding claims further including ejection means such that when

the securing element is in the second position, the retaining member is ejected from said connector.

10. A device according to claim 8 wherein said ejection means comprises a coiled spring and an annular disc
- 5 located on the retaining member such that insertion of said retaining member into said axial through-hole causes compression of said spring by said annular disc.
11. A water spray tooth cleaner including a device according to any one of the preceding claims.
- 10 12. A device substantially as any one embodiment herein described with reference to the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0223332.8
Claims searched: 1-11

13

Examiner: Robert Crowshaw
Date of search: 26 March 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X, Y	X: 1, 3, 5, 6, 8 Y: 11	GB1483157	(GEDIC) Whole document particularly relevant to a female/male pipe coupling arrangement.
X	1-4	US2449920	(WILLIAMS) A male/female arrangement.
X, Y	X: 1-6 & 8-10 Y: 11	FR2358611 A	(STAUBLI) See the figures.
X, Y	X: 1-3 & 5-8 Y: 11	EP0564132 A1	(SMITHS) See figures 6 & 7.
X, Y	X: 1, 3-6, 8 Y: 11	GB2238095 A	(NITTO KOHKI) See figures 1-7.
X, Y	X: 1-3 & 5-8 Y: 11	US4561682 A	(TISSERAT) See the figures.
X	1-3 & 5-8	US4541657	(SMYTH) See the figures for a male/female arrangement.
X, Y	X: 1, 3, 5-8 Y: 11	US4244608	(STUEMKY) See the figures.
Y	11	US4941459	(MATHUR) See figures 2 & 3 for a dental hygiene device with a quick connect faucet coupling.
Y	11	US5387182	(OTANI) See figures 2 & 3 for a dental hygiene device with a quick connect faucet coupling.
Y	11	US3227380	(PINKSTON) See the figures for a dental hygiene device with a quick connect faucet coupling.

Categories



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Application No: GB 0223332.8
Claims searched: 1-11

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Examiner: Robert Crowshaw
Date of search: 26 March 2003

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^v:

F2V

Worldwide search of patent documents classified in the following areas of the IPC^v:

A61C, F16L

The following online and other databases have been used in the preparation of this search report

Online databases EPODOC, JAPIO, WPI